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Research Note

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Forecasts of Crash Fatalities during Summer Holiday Periods in 2004

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Generally, the fatality rates are higher during holiday periods than during non-holiday periods [1, 2]. Analysis and forecasting of the fatality rates during holiday periods are useful for providing warnings that may reduce fatalities. In preceding work, two time series techniques, Holt-Winters (HW) Algorithm and Autoregressive Moving Average Model (ARMA), had been employed to analyze and forecast the fatality counts during holiday periods [2]. For three summer holiday periods in 2003, two forecasts were made based on 1982-2002 historical data. In Table 1, these forecasts are compared with the FARS (Fatality Analysis Reporting System) 2003 Early Assessment File (EAF)‡, to examine the accuracy of the forecasts.

Table 1
Fatalities in Three Summer Holiday Periods in 2003

Holiday Period	FARS 2003 EAF*	Forecasts	
		HW	ARMA
Memorial Day	497	508	504
4th of July	552	537	564
Labor Day	541	526	545
Total	1590	1571	1613

Note: * Early Assessment Files (EAF) of FARS.

In this report, we provide our estimates of fatality counts for three summer holiday periods in 2004. Two similar time series techniques [2] are used to do the analyses and forecasts based on 1982-2002 historical data and 2003 EAF files data. That is, the forecasts are based on an inferred study of past general data behavior over time (time series). The fatality counts for 1998-2003 are shown in Table 2, along with the HW and ARMA forecasts for 2004.

Table 2
Three Summer Holiday Periods' Fatality Counts for 1998-2003 and Fatality Forecasts for 2004

Year	Memorial Day	4th of July (days)	Labor Day
98	393	479 (3)	464
99	500	509 (3)	485
00	466	717 (4)	529
01	515	207 (1)	481
02	491	683 (4)	541
03*	497	552 (3)	541
04	HW: 511 ARMA: 506 95% C.L. (417, 595)	HW: 547 ARMA: 564 95% C.L. (419, 709)	HW: 546 ARMA: 545 95% C.L. (468, 622)

Notes: * 2003 Early Assessment Files of FARS.
Three Summer Holiday Periods in 2004
Memorial: 6:00 pm Fri. 05/28/04 to 5:59 am Tue. 06/01/04
4th of July: 6:00 pm Fri. 07/02/04 to 5:59 am Tue. 07/06/04
Labor Day: 6:00 pm Fri. 09/03/04 to 5:59 am Tue. 09/07/04

‡ Subject to change when the final files of FARS 2003 are available.

[1] U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, <<Traffic Safety Facts 2002>>.
[2] Cejun Liu and Chou-Lin Chen, *Time Series Analysis and Forecast of Crash Fatalities during Six Holiday Periods*, U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, NHTSA Research Note DOT-HS- 809-718.

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